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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/512,047

10/21/2004

Roger Martin Langdon

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EXAMINER

MILLER, ROSE MARY

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/512,047

Applicant(s)

LANGDON, ROGER MARTIN

Examiner

Rose M. Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/21/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because empty diagram boxes are impermissible under 37 CFR §1.83(a) which recites as follows:

*"The drawing in a nonprovisional application must show every feature of the invention specified in the claims. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a **labeled** representation (e.g., a **labeled** rectangular box)." (Emphasis added by Examiner)*

The empty diagram boxes 1, 1a, 14, 14a, 15, 15a, 26, 27, 28, 32, 33, 34, 35, 36, 37, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138 and 139, found in Figures 1 and 2 of the drawings, must be labeled with an appropriate descriptive phrase in addition to the reference legend all ready present. Appropriate correction is required.

Replacement drawing sheets including the correction are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 is rejected as being indefinite as the phrase "the signal processors" lacks a proper antecedent basis in claim 1 from which claim 2 depends. Claim 1 recites "signal processor means" not "signal processors". Please also note that the "signal processor means" of

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claim 1 is singular, not plural. Claims 3-7 are rejected as they fail to correct the problem of claim 2 from which they depend.

Claims 3 and 4 are further rejected as being awkward and confusing. The use of the phrase "a further signal", while not grammatically incorrect, can and does lead to confusion as to that which is being claimed. A suggestion for correction is to specify a different adjective than "further" to clarify the signal (i.e. use the word reference, second, third, etc. depending on the characteristics of the signal).

Claim 6 is further rejected as being indefinite as the phrase "the multiple low pass filters" lacks a proper antecedent basis in claim 2 from which it depends. The first occurrence of the "low pass filters" in the claims is in claim 5. A suggestion for correction is to change the dependency of claim 6 from claim 2 to claim 5.

Claim 7 is further rejected as the phrases "the voltage control oscillator" and the "multiple signal multipliers" lacks a proper antecedent basis in claim 6 from which claim 7 directly depends or in claim 2 from which claim 6 depends. The first occurrence of the "voltage controlled oscillator" and the "multiple signal multipliers" is found in claim 3. As suggestion for correction is to incorporate the body of claim 6 into claim 7 and to change the dependency of claim 7 from claim 6 to claim 3. Other solutions are available, such as changing the dependency of claim 5 to claim 3 and the dependency of claim 6 to claim 5 (as suggested above) to provide proper antecedent basis for the claimed subject matter.

Claim 8 is rejected as the phrase "the signal processors" lacks a proper antecedent basis in claim 1 from which claim 2 depends. Claim 1 recites "signal processor means" not "signal processors". Please also note that the "signal processor means" of claim 1 is singular, not plural. Claims 9-12 are rejected as they fail to correct the problem of claim 8 from which they depend.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 1-5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Langdon et al. (GB 2 265 514 A)** in view of **Rees (US 6,034,760)**.

With regards to claims 1 and 13, **Langdon et al.** discloses a laser vibrometer for identifying remote targets by detecting mechanical vibrations therein (page 1, paragraphs 1-2), the vibrometer having an array of coherent optical receivers for collecting a portion of laser light reflected by a remote target (6, page 3, last paragraph – page 4, first paragraph), each receiver providing a signal representative of the remote target.

Langdon et al. discloses the claimed invention with the exception of each receiver providing a coherent output and the vibrometer also comprising a signal processor means for combining the coherent outputs of the receivers to produce a signal representative of the remote target and for removing laser speckle.

Rees discloses each receiver of an array of coherent optical receivers (89, 91, 92) providing a coherent output (94, column 7, lines 14-19), and the vibrometer comprising signal processor means for combining (94, 96, 100, and phase-locked loop) the coherent outputs of the receivers to produce a signal (102a) representative of the remote target and for removing laser speckle (see column 7, lines 24-47 and column 8, lines 18-23).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of **Langdon et al.** with the signal processing means of **Rees** as the signal processing means of **Rees** can be directly applied to the outputs of amplifiers 15 (Figure 1) of the apparatus of **Langdon et al.** in order to obtain a speckle minimized signal representative of the target with no other modifications to the system of **Langdon et al.**

With regards to claim 2, **Rees** discloses the signal processor comprising a phase-locked loop (column 4, line 59 – column 5, line 1) having multiple inputs (89), in which the signal derived from the multiple inputs (102a) is representative of the remote target (column 5, lines 1-7), substantially unaffected by laser speckle (column 6, lines 17-23).

Therefore, it would have been obvious to one of ordinary skill in the art to include the phase-locked loop in **Langdon et al.** as part of the signal processor for combining the receiver signals to produce the signal representative of the remote target as **Rees** teaches that such a phase-locked loop allows for the removal of the laser speckle from the output signal.

With regards to claim 3, **Rees** discloses the phase-locked loop comprising the multiple signal multipliers (89), said multipliers multiplying the input signals (84) by a further signal (90). With regards to the use of a voltage controlled oscillator for generating the "further signal" (90),

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detecting the frequency by means of a phase-locked loop (PLL) is commonplace in the field of signal processing, whereas a conventional PLL includes a voltage controlled oscillator (VCO). In the method of **Rees** the loop is closed at the optical element level (89, column 5 lines 1-7), therefore in this case "the further signal" is an optical signal (90). **Langdon et al.** in contrast discloses a PLL in the electrical part of the receiver (page 2, second paragraph, lines 9-14). One of ordinary skill in the art would know and use such a PLL comprising that includes a VCO providing one of the multipliers input signals.

With regards to claim 4 and 5, **Langdon et al.** discloses the claimed invention with the exception of the "further signal" comprising a sinusoidal or square wave (as found in claim 4) or the phase-locked loop further comprising multiple low-pass filters, said filters having cut-off frequencies in the kilohertz range (as found in claim 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of **Langdon et al.** with the claimed sinusoidal or square wave signal as both signals are well known throughout the art of measuring and testing and one of ordinary skill in the art would recognize the advantages of one over the other depending on the specifics of the system designed.

It would have been obvious to one of ordinary skill in the art to also include the low-pass filters, as it is well known throughout the art of signal processing that low-pass filters remove extraneous, unwanted noise from a signal. Therefore, one of ordinary skill in the art would know to utilize such filters if the signal to be processed had a low frequency noise that would produce erroneous results if left in the signal.

Allowable Subject Matter

7. Claims 6-12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to teach and/or suggest a laser vibrometer for identifying remote targets comprising, in combination with the other recited elements, either a phase-locked loop which includes a summing amplifier which sums signals generated by a plurality of low pass filters and outputs a signal to an integrator or an autocovariance processor having multiple

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inputs in which the signal derived from the multiple inputs is representative of the remote target, substantially unaffected by laser speckle.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Buckles (US 3,633,999) discloses removing speckle patterns from objects illuminated with a laser.

Gardner et al. (WO 86/06845) discloses an optical diffraction velocimeter.

Newman (US 4,524,250) discloses non-destructive testing by laser scanning.

Tai et al. (US 4,934,815) discloses an aperture sampling coherence sensor and method.

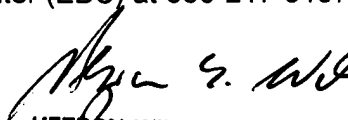
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rose M. Miller whose telephone number is 571-272-2199. The examiner can normally be reached on Monday - Friday, 7:30 am to 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RMM
11 December 2005



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